D-7912 / LINURON SR 4-14-86

Shaughnessy #: 035506

Date out of EAB: APR 14 1986

Signature: [signature]

Releasable

To: I. Sunzenauer
Product Manager # 78
Registration Division (TS-767)

From: Joseph C. Reinert, Chief
Special Review Section
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

JCR

Attached please find the EAB review of:

Reg./File No.: 169712

Chemical: Linuron

Type Product: Herbicide

Product Name: Lorox

Company Name: DuPont

Submission Purpose: Label Amendment

Date In: 18 March 1986

Date Completed: 11 April 86

Monitoring Requested: _____

Monitoring Voluntarily Done X

Action Code: 827

EAB # 6463

TAIS (level II) Days

2

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

_____ Benefits and Use Division

4 pages

1.0 INTRODUCTION

E.I. DuPont De Nemours has submitted a request to amend linuron labels to include aerial application. The use of human flaggers would be prohibited unless the flagger was in a totally enclosed vehicle. DuPont contends that aerial application is important for carrots, celery, and for emergency use in wet weather when ground equipment is impractical.

The registrant has submitted a report by Orius Associates, Inc. entitled "Comparison of Mixer/Loader and Applicator Exposure to Pesticides Applied by Aircraft or Ground Boom Equipment". The report essentially reviewed published ground boom and aerial application exposure studies and concluded that no difference exist in the rate of exposure of workers using ground boom or aerial equipment.

2.0 EXPOSURE ASSESSMENT BRANCH ANALYSIS

EAB has evaluated exposure studies available in the published literature. The purpose of the evaluation was to establish a generic surrogate data base for the application of pesticides. These studies will be discussed in the Linuron Postion Document 2/3. Mixer/loader exposure was evaluated for mixer/loaders wearing protective gloves and using either open pour or closed loading systems. The evaluation of 19 replicates estimated mixer/loader exposure as 0.95 mg/lb a.i. handled for open pour loading. When closed loading systems were used the exposure was 0.023 mg/lb a.i., based on 20 replicates. Based on each pound of linuron handled, a mixer/loader would be expected to receive the same exposure whether he was loading into a tractor boom spray tank or an aircraft spray tank.

An aerial mixer/loader will be expected to handle more active ingredient per day than a ground boom mixer/loader because the aircraft can apply more pesticide daily than a tractor. It is probable that a given mixer/loader in an aerial operation will receive greater exposures due to handling larger quantities of linuron; however, commercial aerial operations that use closed loading systems would reduce or eliminate this difference compared to open pour mixer/loaders.

Dermal exposure to pilots and ground boom tractor applicators was evaluated. A total of six studies containing 92 replicates showed that ground boom applicator dermal exposure ranged from 0.33 mg/hr to 146 mg/hr with a geometric mean of 2.6 mg/hr. Pilot exposure, based on an evaluation of six studies with 29 replicates, was estimated to be 0.67 mg/hr with a range of 0.03 to 1.0 mg/hr. The ground and aerial exposure estimates are based on an application rate of 1.0 lb a.i./acre.

A comparison of pilot and ground boom applicator exposure estimates indicate that pilots receive an average of 25% less dermal exposure per hour. This difference is even greater when the quantity of active ingredient handled is accounted for. Based on usage data provided by BUD for preemergent herbicides, a ground applicator treats 110 acres and a pilot treats 480 acres during a work day involving 5 to 6 hours of actual spray time. Therefore, with similar application rates, a pilot receives one fourth the exposure while applying four times the active ingredient or 1/16 the exposure of a ground applicator applying the same quantity of active ingredient.

3.0 CONCLUSIONS

Ground boom mixer/loaders and aerial mixer/loaders are expected to receive identical exposure to linuron based on each pound of active ingredient handled.

The annual exposure to aerial mixer/loaders would be expected to be greater than the annual exposure to ground boom mixer/loaders because aerial mixer/loaders could be expected to handle larger quantities of linuron annually.

Pilots receive less exposure to linuron than ground boom applicators. EAB estimates that per pound a.i. applied the pilot's exposure is less than a tenth of the ground boom applicator's exposure.

4.0 RECOMMENDATION

Prior to the removal of aerial application from linuron labels by DuPont, aerial application was a small percentage of linuron application. Aerial application was primarily confined to carrots, celery, and emergency backup to ground application when rains saturated the ground.

Assuming that acreage previously treated by air is now treated by ground, annual exposure to mixer/loaders should have remained constant and applicator exposure is estimated to have increased. Reinstatement of aerial applicator is predicted to reduce applicator exposure to acreage aerially treated with linuron.

EAB recommends that aerial application be reinstated on linuron labels in order to reduce applicator exposure. It is also recommended that the label recommend the use of closed loading systems for both commercial ground and aerial operators because they handle larger quantities of linuron on an annual

basis than do private farmers. DuPont's recommendation that the statement "Human flaggers prohibited unless in totally enclosed vehicles" must be required on linuron labels.

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